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Fig. 2B illustrates a detail of the installation in a second position, in a side view,

Fig. 2C illustrates a detail of the installation in a second position, in a side view, where newspapers are discharged from the track,

Fig. 3 illustrates several tracks arranged concentrically relative to each other, and

Fig. 4 illustrates several tracks arranged concentrically relative to each other, where the innermost track has a plurality of layers of newspapers.

Description of Preferred Embodiments

The invention will now be described in more detail with reference to the schematic drawings, which illustrate an embodiment of the present invention.

The installation according to the present invention comprises a conveyor track, which is designated 1 in the drawings. For the sake of simplicity, the conveyor track 1 will below be referred to as the track. Moreover the installation comprises a conveyor 5 which supplies the products to the track 1, a receiving conveyor 4 which receives the products as they are discharged from the track 1, see Fig. 1. The conveyors 4, 5 that are used in the invention are of the type that is used to handle printed products, known to a person skilled in the art.

The track 1 is adapted to store preferably newspapers, supplements and other similar printed products. The track 1 which is used according to the present invention is a conventional conveyor track known to a person skilled in the art. The track 1 can, for instance, be driven by a motor 10 which via a gear 12 drives chains or the like included in the track 1. The supporting layer of the track 1 may consist of links made of plastic or like materials, conical rolls, overlapping plates or the like, according to prior-art technique. The technical solution of the track 1 and the driving thereof constitute prior art and may be varied according to the user's needs and options.

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The track 1 is substantially circular, but may also have a slightly deviating shape. By substantially circular is meant according to the invention circular \pm manufacturing tolerances. The circular shape of track 1 means that no relative motion arises between the printed products that are stored on the track 1, which results in a considerable reduction of the risk of printing ink smearing between the printed copies.

The track 1 is arranged so as to provide an opening 2. The opposite sides in the opening 2 consist of sprockets or the like which drive the track 1, see Figs 2A-2C. A means 3 in the form of a flap or the like is movably arranged in the opening 2. In a first position, the flap 3 is lowered to the same level as the track 1, see Fig. 2A. In this position the track 1 is continuous and extends advantageously through 360° \pm manufacturing tolerances. In a second position, the flap 3 is raised, see Figs 2B-2C. In this second position, the track 1 is emptied of printed products through the opening 2. Then the printed products reach a receiving conveyor 4 or some other suitable device.

In one embodiment of the present invention, the flap 3 is wedge-shaped, seen from the side, as it is mounted according to the invention, see Figs 2A-2C. The flap 3 further has a flat upper side, the side of the flap which is in level with the track 1, see Figs 2A, 3 and 4. Owing to the flat upper side of the flap 3, the flow of newspapers will not be obstructed, but may easily pass the flap 3 (when the flap 3 is in its first position). The front edge 6 of the flap is straight and designed so as not to interfere with the flow of newspapers and, for instance, hit the spine of a newspaper and bend the newspaper. In another embodiment, the front edge 6 of the flap may be designed as a blunt arrow (not shown), for the same purpose as stated above.

The flap 3 is provided with smooth polished surfaces so as to be able to deflect the flow of printed products

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without disturbing the flow. The flap 3 is advantageously made of stainless steel or some other material with similar properties. The size of the flap 3 should correspond approximately to the width of the printed products that are to be conveyed and stored on the track 1, for instance the width of a newspaper, and be slightly smaller than the opening 2. The flap 3 is movably suspended from one of the drive shafts of the track 1, said drive shafts constituting the opposite sides of the opening 2, see Figs 2A-2C.

The flap 3 further is mobile and adapted to operate rapidly between the first and the second position. The flap 3 moves up and down preferably by means of a pneumatic cylinder (air cylinder). The flap 3 can also move by means of a hydraulic cylinder, be electrically driven, be driven by a servomotor, move by means of pull-type electromagnets or like technique which is known to a person skilled in the art.

The printed products are supplied to the track 1 by means of a tangentially arranged conveyor 5 which is arranged above the track 1. The conveyor 5 supplies the products straight in the track of the tangent, see Fig. 1. The conveyor 5 can be placed anywhere in the track 1, except in direct connection with the opening 2. This results in great freedom as to the design of the installation according to the invention. The conveyor 5 is vertically adjustable so as to follow the stack of products as it grows or falls.

When the products are supplied to the track 1, they are placed with a newspaper overlap of usually between 40 and 50 mm (overlap = how much the newspapers overlap each other). The overlap may be varied as required and depends, inter alia, on the speed at which the track 1 is run. The track 1 is run at a speed corresponding to the supplying conveyor 5, usually about 60 m/min. A track 1 according to the invention holds a considerable number of printed products. The greater the diameter of the track

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1, the greater volume of printed products can be stored. For example, a track with a diameter of 12 m can store about 30,000 printed products. The maximum height for a track is about 0.5 m; the stack with printed products being higher at the inner edge of track 1 than at the outer edge of track 1, according to a fan effect.

The product that is first supplied to the track 1 is first discharged from the track, which means that the lowermost layer is discharged first. The track 1 can be emptied of a desired number of a printed products through the opening 2 and after that the flap 3 can be lowered. It is possible to merely fill or merely empty the track 1, or to fill as well as empty the track 1 at the same time, which means that the processes of supplying and discharging products are fully independent of each other. When products are stored on the track 1, the desired number of products are supplied to the track, after which the process is stopped. When later the entire, or parts of, the stock is to be discharged, the flap 3 is opened (put in its second position) and the track 1 is started.

A plurality of tracks 1 can be arranged in a system. The tracks 1 then operate quite independently of each other. A plurality of tracks 1 can, for example, be arranged freely one above the other in some kind of frame (not shown), according to prior art. With different diameters of the tracks, they can also be arranged inside and outside each other, concentrically, which means that a large system that can handle large numbers of printed products can be constructed if desired, see Figs 3 and 4. In a system with a plurality of tracks, one conveyor is advantageously used for each track 1. In another embodiment, it is possible to have the same conveyor for all or some tracks 1, but this reduces the flexibility and the independence between the tracks 1.

The installation according to the invention can be arranged on the first floor, or higher, as one or more entresols. In this way it is possible to use the surface

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under the installation, which means that quite a lot of space will be saved.

The track 1 can also be provided with one or more edgings (not shown) to prevent the products from leaving the track 1. The edging can be arranged at the inner edge or outer edge of the track 1, or at the inner as well as outer edge. The track 1 is arranged so that the products should stay on the track 1 also without an edging, but one or more edgings can be considered an extra security function.

The present invention should not be considered restricted by the above description, and a number of variants and modifications are feasible within the scope of the appended claims.

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Reference numerals

Track	1
Opening	2
Means/flap	3
5 Receiving conveyor	4
Conveyor (supplying products to the track)	5
Front edge of the means/flap	6
Motor	10
Gear	12

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